



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,938	05/03/2006	Timothy J. Phillips	1241158	5737

23117 7590 09/02/2008
NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER

WEISS, HOWARD

ART UNIT	PAPER NUMBER
----------	--------------

2814

MAIL DATE	DELIVERY MODE
-----------	---------------

09/02/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/577,938
Filing Date: May 03, 2006
Appellant(s): PHILLIPS ET AL.

Stanley C. Spooner
Reg. No. 27,393
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/9/2008 appealing from the Office action mailed 12/29/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO 03/081674 A1	Phillips	10-2003
WO 01/93337 A1	Phillips	12-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Art Unit: 2814

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 to 9, 12 to 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Phillips (WO 03/081674 and hereinafter Phillips '674).

Phillips '674 show all aspects of the instant invention (e.g. Figure 4) including a quantum-well FET with a narrow bandgap region **22** made of InSb, with two further layers **21,23** on each side subsection said narrow bandgap region providing compressive mechanical strain and primary/secondary conduction channels, being no more than 0.4 eV and a layer of p-type material (Page 10 Lines 21 and 22) and partly intrinsic conduction and said transistors in logic circuits (Page 4 Lines 11 to 14).

3. Claims 1, 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Phillips (WO 01/93337 and hereinafter Phillips '337).

Phillips '337 show all aspects of the instant invention (e.g. Figure 1) including a NPN transistor **10** with a P-type material base region **21** with a base contact **24**, emitter **36** and collector **16** arranged as claimed and having bandgap greater than 0.e eV and doping level greater than 10^{17} cm^{-3} .

(10) Response to Argument

A. Rejection of Claim 9 and 16 under 35 USC 112 (First Paragraph)

First and foremost, the Appellants' arguments concerning the rejection of Claims 9 and 16 under 35 USC 112 (first paragraph) are persuasive and this rejection has been

Art Unit: 2814

dropped by the Examiner. This leaves only the rejections under 35 USC 102(b) based on the listed prior art references.

**B. Rejection of Claim 1 to 9, 12 to 14 and 16 under 35 USC 102(b)
anticipated by Phillips (WO 03/081674 and hereinafter Phillips '674)**

The Appellants state that Phillips does not contain any disclosure of "at least one narrow bandgap region under compressive mechanical strain" as stated in independent Claims 1 and 16. The Appellants further say that Phillips '674 does disclose any doping inherently providing compressive mechanical strain and that other parameters (such as layer thickness) can provide mechanical strain. Finally, the Appellants state that Phillips '674 teaches away from the claimed invention since the structure in Phillips '674 is strain balanced i.e. no strain.

The narrow band-gap, p-doped structure in the device of Phillips '674 (region **22** as depicted in Figure 4) is identical to the instant invention (region **5** shown in Figure 1 of the instant application) in both material and thickness. The narrow band gap region in both figures is an InSb (indium antimonide) layer of about 20 nm thickness surrounded by InAlSb layers (**21,23** in Phillips '674 and **4,6** in the instant application). As admitted by the instant invention (Page 3 Lines 26 to 30), compressive strain results because of the difference in lattice constant between the InAlSb/InSb layers. Therefore, the compressive strain is an inherent product of this layered structure. Phillips '674 alludes to this strain in Lines 12 to 14 on Page 10 by giving effective band gaps when strain and quantization effects are taken into consideration (Lines 21 and 22, on the same page, were listed in the Examiner's rejection to support that the p-doping of the layers, not to

Art Unit: 2814

support doping as the source of compressive strain, as mistakenly interpreted by the Appellants).

As stated in MPEP 2112 (V): "ONCE A REFERENCE TEACHING PRODUCT APPEARING TO BE SUBSTANTIALLY IDENTICAL IS MADE THE BASIS OF A REJECTION, AND THE EXAMINER PRESENTS EVIDENCE OR REASONING TENDING TO SHOW INHERENCY, THE BURDEN SHIFTS TO THE APPLICANT TO SHOW AN UNOBVIOUS DIFFERENCE.". Additionally, MPEP 2112.01 (I and II) state: "WHEN THE STRUCTURE RECITED IN THE REFERENCE IS SUBSTANTIALLY IDENTICAL TO THAT OF THE CLAIMS, CLAIMED PROPERTIES OR FUNCTIONS ARE PRESUMED TO BE INHERENT" and "IF THE COMPOSITION IS PHYSICALLY THE SAME, IT MUST HAVE THE SAME PROPERTIES." In this case, the structures in Phillips '674 and the instant invention are identical structures comprising InAlSb/InSb/InAlSb layers. The instant invention claims that the InSb layer would have compressive stain due to its proximity to the InAlSb layers. Therefore, the presence of compressive strain in the InSb layer of the Phillips '674 is inherently present as it is in the instant invention. If the Appellants insist this is not the case, they must show why the InSb layer of the instant invention has compressive strain when Phillips '694 does not.

In reference to Phillips '674 teaches away from the claimed invention by teaching a strain-balanced structure, balanced strain does not mean the absence of strain. It means that the collective strain in the layers cancel each other out. There is still strain present in layers.

C. Examiner fails to even allege that Phillips '337 (i.e. WO/01/93337 A1) contains "at least one narrow bandgap region under compressive mechanical strain"

The Appellant states that the Examiner's rejection of Claims 1, 10 and 11 under Phillips '337 does not even allege that the device in Phillips '337 has a small band gap material under compressive mechanical strain. However, the structure shown in Figure 1 of Phillips '337 depicts the p⁺ base layer **18** made of InSb in contact with two layers **20,26** of InAlSb. As stated above and in the Specification (Page 6 Lines 9 to 11), the difference in lattice constant between the InSb/InAlSb layer imparts a compressive strain to the narrow band gap base making the presence of this strain an inherent property of the configuration. While this is not explicitly stated in the rejection, it is implied in view of the previous analysis and statements.

D. No Basis for any Future Obvious rejection using the Stated Prior Art

The Appellant's statement the any anticipated rejections based upon 35 USC 103(c) should not be considered or attempted because of previous assignment of the prior art to the inventive entity as the instant invention is premature and incorrect. Both Phillips references used in these rejections are under 35 USB 102(b) and are legitimate prior art under any circumstances.

E. and F. Failure To Establish A *Prima Facie* Case Of Anticipation

The above arguments clearly establish the legitimacy of the Examiners rejection establishing a prima facie case of anticipation by the stated prior art to the instant invention.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Art Unit: 2814

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Howard Weiss/

Primary Examiner

Art Unit 2814

Conferees:

Wael Fahmy /W. M. F./

Supervisory Patent Examiner, Art Unit 2814

Ricky Mack /R. L. M./

Supervisory Patent Examiner, Art Unit 2873